

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/021026

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H04L27/26 H04L1/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	-/--	

☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

### \* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

23 November 2004

Date of mailing of the international search report

08. 03. 2005

Name and mailing address of the ISA

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Authorized officer

Yang, Y

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## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-13, 14-21, 22-25, 26-29, 38-41

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13,14-21,22-25,26-29,38-41

Method for transmitting one or more training symbols in a multiple antenna communication system where at least one training symbol is transmitted using at least one antenna from a transmitter having N antennas, such that said at least one training symbol can be interpreted by a receiver having M antennas (M is less than N). Method for receiving an indication of a duration to defer until a subsequent transmission, and deferring for said indicated duration.

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2. claims: 30-33,34-37

Method for communicating in a multiple antenna communication system comprising the step of: transmitting one or more symbols from a transmitter having N transmit branches, obtaining feedback from at least one receiver indicating a performance for at least one of said N transmit branches, and adapting one or more parameters of said at least one of said N transmit branches.

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Inter.

I Application No

PCT/US2004/021026

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>MYEONGCHEOL SHIN ET AL: "A new training symbol structure to enhance the performance of channel estimation for mimo-ofdm systems"</p> <p>2003 IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH, AND SIGNAL PROCESSING. PROCEEDINGS. (ICASSP). HONG KONG, APRIL 6 - 10, 2003, IEEE INTERNATIONAL CONFERENCE ON ACOUSTICS, SPEECH, AND SIGNAL PROCESSING (ICASSP), NEW YORK, NY : IEEE, US,</p> <p>vol. VOL. 1 OF 6,</p> <p>6 April 2003 (2003-04-06), pages IV397-IV400, XP010641180</p> <p>ISBN: 0-7803-7663-3</p> <p>the whole document</p>	<p>1-5,</p> <p>11-18,</p> <p>21,38-41</p>
Y A	<p>-----</p>	<p>7,20</p> <p>6,8-10,</p> <p>19,22-29</p>
Y	<p>SUMEI SUN; WIEMER I; HO C K; TJHUNG T T:</p> <p>"Training sequence assisted channel estimation for MIMO OFDM"</p> <p>WCNC 2003 - IEEE WIRELESS COMMUNICATIONS AND NETWORKING CONFERENCE,</p> <p>vol. 1, 16 March 2003 (2003-03-16), pages 38-43, XP002304707</p> <p>NEW ORLEANS, LA, USA</p> <p>the whole document</p> <p>-----</p>	<p>7,20</p>